

CANADA WOOD ASHES.

THE CHEAPEST AND BEST FERTILIZER IN USE IS

CANADA UNLEACHED WOOD ASHES

IMPORTED BY

MUNROE, JUDSON & STROUP,

NO. 32 ARCADE BLOCK,

OSWEGO, N. Y.

GENERAL ANALYSES

AS TO THE

Value of Unleached Wood Ashes

The market value of Unleached Ashes would be about as follows for a ton of 2000 lbs. :

Pure Potash.....	140 lbs.	\$11.90
Phosphoric Acid.....	40 "	4.00
Lime (Vegetable).....	780 "	7.80
Magnesia.....	55 "	1.10
Soda.....	30 "	.90
Sulphuric Acid.....	30 "	.90
Silica	140 "	
Oxide Iron and Alumina	40 "	
Carbon and Carbonic Acid.....	500 "	
Chlorine.....	1 "	
Which makes the total value per ton.....		\$26.60

Prof. C. A. Goessmann, Amherst, Mass., says in his report on ashes: "The universal high opinion of wood ashes as a fertilizer does not depend merely upon a fair percentage of potash, but also on the presence of more or less of all the various mineral elements essential to the growth of plants. Wood ashes like barnyard manure, on account of their compound character, meet to some extent at least not only known but unknown deficiencies in valuable soil constituents. The thorough mixture of the various constituents have, no doubt, a beneficial influence on their action"

WE SELL IN CAR LOAD LOTS ONLY, EACH CARRYING FROM FOURTEEN TO SEVENTEEN TONS.

But where less than a car load is desired, parties or neighbors can join, each taking a half car load, and then we can divide the ashes in putting them into the car with one half in each end of the car.

OUR PRICE DEPENDS UPON THE DISTANCE

from port of entry to destination, railroad rates of freight &c., price at the depot where unloaded varying from

\$15 to \$20 PER TON.



To Farmers and Gardeners.

GENTLEMEN—We would be pleased to have you examine the Analyses found upon the last pages of this pamphlet of our “Canada Unleached Hardwood Ashes,” which have been made by some of the best chemists in Massachusetts and other States who are at present employed by the State authorities, and placed in charge of agricultural experimental stations of those States. From such analyses it will be seen that our unleached ashes contain from $5\frac{1}{2}$ to 8 per cent of Potassium of Oxide, or pure Potash, equal to from 9 to 14 per cent of Carbonate of Potash, which is the most valuable of all Potash for agricultural purposes, especially for all fruit and fruit trees. With our long experience of some nineteen years in handling Wood Ashes in different States, with their various kinds of soils, and with thousands of men who have bought and used our Ashes year after year with perfectly satisfactory results, we may perhaps be pardoned if we allude to our success in introducing our “*Unleached Wood Ashes*” with a degree of pride. Our ashes have stood the tests of the chemists in every case. In many instances chemists have sought out the cars containing our ashes, without our knowledge or that of the purchaser even, and have taken samples and analyzed them, and we have yet to hear of a poor sample taken from any car loaded by us; and we load several hundred of them a year. No test that has been made places the pure Potash below $4\frac{3}{4}$ per cent., and generally running from $5\frac{1}{2}$ to $7\frac{1}{2}$ per cent. pure Potash, or equal to from 9 to 14 per cent. carbonate of Potash. Entire satisfaction we can truthfully say, has been expressed by all who have given our ashes the most thorough tests,

both with the quality and price, and more particularly after a few years of use when they find their returns plainly visible in the ripening grain or the lusciousness of their fruit. Some have gone so far as to say they really derive more benefit from a ton of our ashes than from a like quantity of mercantile fertilizer costing more than double what the ashes do. Home ashes have been sold in some sections at from 40 to 50 cents per bushel, or equal to about \$20 to \$25 per ton, and the consumers have even at this price found them very profitable for grass, fruit, sweet potatoes, onions, melons, squashes, cucumbers, vegetables and especially fruit trees.

The name, "Wood Ashes," is not always a guarantee of the value contained in the article, for there is as much difference in the quality and value of Ashes as there is in tea, coffee, sugar, or any other article of food or merchandise. The name does not signify their quality or value. It is our long experience that enables us always to select the best and purest ashes; also ashes from the best material, and that have been grown upon the best of soil to produce the best results upon growing crops. This knowledge also enables us to guarantee our ashes to be the best in the market. Having made the ash trade a specialty, and our entire business, we believe from this experience we are able to supply all who may favor us with their orders with the best quality of pure Unleached Wood Ashes from the best granite soils of the Dominion of Canada.

MUNROE, JUDSON & STROUP,
32 ARCADE BLOCK, OSWEGO, N. Y.

CONDITION OF OUR ASHES WHEN GATHERED.

Our ashes are gathered from house to house in a dry condition and containing more or less charcoal, (as all ashes do that are burned in stoves and fire places) and stored up in large ash houses erected for that purpose, while those stored in bulk together perhaps for months awaiting shipment, then go through, first a heating process and then a heavy sweating process, during which the chemical action of the potash and lime upon the charcoal dissolves or eats it up, so that when we ship the ashes we find they have settled down about one-fifth from what they were when first gathered in. So after this heating process has taken place, while our ashes have diminished in bulk they have become much more valuable and less bulky than home ashes containing as they do larger quantities of potash, lime, phosphoric acid and silica in a more concentrated form ; and then having passed through this chemical change, while heating and sweating, they are in better condition for the needs and purposes of agriculture than when first gathered as this process leaves them in a revertable form, so that the potash and some of the other constituents are soluble at once, while the other elements are in a condition to be used by the plant and soil as required.

The ashes also absorbs large quantities of carbonic acid from the atmosphere while lying in large bulks, going through the heating and sweating process, and continues to do so while lying in bulk with all the potash in them ; so that our ashes analyze from 23 to 32 per cent. carbonic acid which is quite valuable in its action upon the soil with the lime and potash aiding largely in furnishing nitrogen from the atmosphere. The ashes when first gathered from the houses, weigh from 34 to 40 pounds per bushel, but after going through the heating and sweating process eating up of charcoal, shrinking away about one-fifth, requir-

ing considerable more ashes for the bushel than when first gathered, causes them to weigh from 42 to 50 pounds per bushel by the time they get to destination of shipment, or an average of 44 to 45 pounds or about 45 bushels to the ton, although there is sometimes quite a difference in the bulk of the ashes in a ton, we don't think there is any material difference in the amount of fertilizing elements contained in either ton, as the difference is mainly caused by one lying longer in bulk than the other, which is the best, if anything, prepared for a quicker action on the soil and crop. It is not the large bulk that is required in an article, but it is strength and value in a concentrated form, like a gold dollar against a silver one will buy as much as the silver dollar, and is very much the easiest to carry.

One of the most important facts to which the gardener or farmer should give his attention is the *analysis* of the several different kinds of crops that he may wish to grow, so that as he gathers in his crops or fruit, he may know as near as possible the different elements that those crops have taken from his soil in the form of *Potash, Phosphoric Acid, Lime, Magnesia, Silica, Soda, Sulphuric Acid, Oxide of Iron and Ammonia*. He should also examine the analysis, not only of unleached wood ashes, but also of all other fertilizers and manures, and from the knowledge thus acquired he will be the better able to judge which fertilizer will furnish most nearly the required ingredients in their most natural and concentrated forms to supply and replenish the land from which he has just removed his crops, and thus place his land in the best condition for similar or other crops which may follow in their turn and at the same time improve the fertility of his soil, by furnishing to it such manures and fertilizers as will replace to the greatest extent all those elements of the soil which have been taken from it by frequent and continual cropping and by this *restoring process*, he will be able to keep his land in the most perfect state of cultivation and ready at all times for any crop he may wish to propagate, and this too at the least possible cost. With this end in view we have given a few tables of analysis of various crops which can be found upon the last pages of this pamphlet, by which it will be seen that our unleached ashes analyze and make a favorable showing of all the elements found in all crops, except nitrogen. This element of nitrogen, we claim, is furnished as required by the plant, or crop, or fruit, through chemical action of the ashes in the soil, and upon

the atmosphere, with the assistance of the large quantities of carbonate of potash, phosphoric acid, carbonic acid and lime contained in the ashes.

We know that anyone who will take the trouble to thoroughly inform themselves, will become satisfied that our unleached wood ashes are the best and most natural fertilizer that he can use; being formed by nature and drawn up from the new and native soil in a soluble form through the roots of the trees from which they are burned, put them into the best possible form, and makes them really a

“NATURAL FERTILIZER”

for all the different kinds of crops and fruit, far outstripping stable manures. Unlike many patent fertilizers they are not “stimulants,” but their effects are very lasting and will bring the poorest land and soil that have been long worn out with continued use, up into rich and fertile fields of real value. Their use always insures a good return for the money expended, making the soil strong, loose, mellow and sweet, and not only this but a great saving is made of from 25 to 40 per cent., by the frequent and continued use of our unleached wood ashes as against the purchase and use of the quick-acting, short-lived, stimulating fertilizers that gradually impoverish the soil; although in some cases they may seem cheaper than the ashes for the first one or two years, but in the end are found to be the most costly, as they do not contain all the necessary elements required to grow and mature the crops, and being highly treated as they are with sulphuric acid makes them soluble and also acts on the soil, rendering everything soluble at once so as to act with the fertilizer, thus making a good show for a while, but the soil is soon filled up with acid, and at the same time being robbed of its strength by this crowding process, and there being no restoration made, it must certainly grow *weak, sour, cold, heavy*, lumpy and finally worthless. And right here let us call particular attention to the element of *Lime*, which, by analysis, is found to exist in large proportions in our *unleached ashes*. This lime is vegetable, very *fine* and *concentrated*, and worth from four to five times as much as common “Stone Lime” for agricultural purposes, on account of its fineness and concentrated strength having been absorbed from the virgin soil through the roots of the tree in a soluble form, and when applied again to the soil in the form of *Ashes* combining as it does, with carbonic acid and all the elements

which originally existed in the tree, viz : Potash, Phosphoric Acid, Iron, Magnesia, Soda, Sulphuric Acid and Silica, it becomes a ready food for plant or vegetable, and at the same time nourishes the soil. Lime applied in this way, having once been soluble, needs but a few showers from nature's great reservoirs to again render it soluble and ready to act upon the soil, with the carbonic acid, promptly liberating such elements as have been lying useless and undisturbed perhaps for long years. *Stone Lime* being a mineral and very much coarser and harder, only a small proportion of that which is applied dissolves or becomes soluble and mixes with the soil or renders any aid to vegetation quick enough. Again, "*Stone Lime*," being coarser and heavier than the vegetable lime in ashes when applied to light, sandy and porous soil, has a tendency to work down through the soil to too great a depth so quickly, that but very little benefit is derived from its use, and the conclusion is reached that such land does not need lime. Such is not the case, but all land needs the lime and carbonic acid applied to it in connection with all the elements contained in unleached ashes, and especially light, porous and sandy soil, rendering it more like loam and less porous, so that it is capable of holding fertilizer, when applied, and therefore the fertilizer does not leach off and dry up as soon as before, and can do its necessary work both upon the soil and supply food to the plant, whereas it would require at least four or five times as much Stone Lime to produce like results. There are many kinds of soil that will take from eight to ten times as much Stone Lime to produce the same results as the lime contained in wood ashes. Stone Lime being worth from four fifty to five dollars per ton, would of course from this reasoning make the vegetable Lime found in our unleached ashes worth at least from eighteen to twenty dollars per ton.

This theory has been very thoroughly tested where leached ashes have been applied that only contains about one per cent. of Potash, and over thirty per cent. of Lime to soil that "Stone Lime" seemed to have no good effect upon, giving large and satisfactory results, so long as the minute quantity of Potash which the ashes did contain lasted, for which the farmer paid as high as from eighteen to twenty four cents per bushel. and considered them as cheap a fertilizer as he could buy until he came to apply our Unleached Ashes, which he found to be the cheapest of all fertilizers, restoring to the exhausted soil all the necessary ingredients through the chemical action

of the lime and carbonic acid in the Unleached Ashes. It is true that stone lime may be somewhat aided in its action upon some soils, by using with it potash and phosphoric acid in other forms, and when so used becomes a more expensive fertilizer than the unleached ashes; and, as before stated, brings greater exhaustion to the soil because some very important elements are lacking which are contained in the ashes and that cannot be supplied from any other source. A further test has been made by using leached ashes containing only from ten to twelve per cent of lime and potash upon the same field side by side with leached ashes that contained thirty per cent. lime and one per cent. potash, the results not being half as good from the ashes with the less quantity of lime as with the ashes having the thirty per cent. lime in them, which shows unmistakably the great value of lime in ashes. These tests have repeatedly been made and with the same results in all cases, and in localities where they have been in the habit of using leached ashes. Some of the farmers who used these two kinds of ashes upon their fields, side by side, could not understand the reason why some leached ashes did so much better than others, and all treated alike, little thinking that the trouble lay in the small per cent. of vegetable lime. These poorer qualities of ashes had been furnished by men with little or no experience, and who were no judges of ashes, and were unacquainted with the kind of timber, soils and localities which furnish the best qualities of ashes; for there are many kinds of hardwood *timber*, even which do not absorb from the soil as much *lime*, Potash, Phosphoric acid, Silica, Magnesia and iron as some others, and therefore the ashes from the former timber are not so valuable as a fertilizer. It will be seen by reference to the analysis of crops given herein that nearly all of them require a large percentage of what is known to chemists as

SILICA AND MAGNESIA

as well as Potash, Phosphoric Acid, Lime and other elements supplied by the use of unleached ashes. Silica enters largely into the growth, make-up and construction of the stalk in corn and the straw in wheat, oats, barley, rye, and the coating of the berry and must be supplied in some form to nearly all soils in order to have the crops thrive and grow. For where this element is lacking in the soil the crops will be found to "lodge," or french or fall down. No matter how rank and thrifty the growth unless the soil is sufficiently supplied with Silica to give coating and strength

to the straw the crop must be declared a failure. Although nearly all soils contain large quantities of Silica in an insoluble form, and of course of no value to the plant without the application of unleached wood ashes to dissolve and liberate it and set it in action. We deprecate the use of Sulphuric acid found in certain grades of fertilizers as being deleterious to the land, and because of its "forcing" nature, which will be readily understood when we state that in the making of some of them from 30 to 40 per cent. of Sulphuric acid is used, which is out of all proportion with the needs of any soil, and its application results only in injury in the end, unless very heavily ashed or manured afterwards to replace what is taken from the soil. Again, where Silica is lacking in the soil, unless supplied not only to coat and strengthen the straw, the berry, instead of being plump, full and heavy, will be shrivelled, shrunken and light. Even where there is plenty of stable manure at hand to supply fully the demand, still it will be found very profitable to add either as a top dressing spread broadcast or in the drill, at least one-half the value of the manure in unleached ashes, and the reward will be a thrifty crop that is sure to stand up well with a large, full and plump berry weighing, if wheat, from 62 to 64 pounds per bushel. We have yet to hear of a single instance where corn has "lodged" or frenched where good, unleached wood ashes have been properly used by the farmer. Fields of corn have been grown year after year for forty years with no other fertilizer than unleached ashes, starting in with a yield of thirty bushels to the acre, and increasing from year to year until the yield had reached from 70 to 100 bushels per acre, and this result was reached by first spreading about one-fourth of a pound of unleached ashes over the tops of the hills as soon as planted each year for five or six years, covering about fifteen inches of the surface of the hills until all the ground was well ashed over, and afterwards 600 to 700 pounds were spread broadcast over the field each year; the soil at first was quite light and sandy, but now has become a fine, heavy soil like loam, and not easily effected by drouth. The most of those ashes were purchased at 35 cents a bushel or equal to \$16 to \$18 per ton, and considered very profitable at those prices. If the soil should require more vegetable matter than is found or supplied by ashes, by a continual use of them for years it can be furnished by seeding down heavily with clover and ploughing under occasionally far cheaper than by the use of manure, for you can surely grow clover where good, unleached ashes are used; also at

the same time large quantities of nitrogen are replaced by the chemical action of the ashes on the atmosphere, clover and its roots being used as storehouses to hold and deliver as required by the plant and crop. We find it is conceded by those best informed that for

GRASS AND FRUITS

of all kinds unleached wood ashes are not excelled by any fertilizer in use, not even by the best stable manure, for they combine all the elements that are required to grow the peach or pear tree, and in fact any kind of tree, vine or fruit, as the trees of the forest are grown by nature's fertilizers as found in the soil and without forcing, and live and do well for hundreds of years. There can be no reason why a fruit tree, either peach, apple, pear, cherry or orange should not live many more years than they frequently do by furnishing them with the proper "plant food" in the form of "unleached ashes," and thus render them healthy, hearty and every year bearers of fruit of a bright, healthy color and of a delicious flavor, and less liable to decay, and with another important item in their favor, that such fruit is very much sweeter than where grown with manure, and always brings the highest price in the market.

We have had nineteen years experience in handling ashes, both leached and unleached, but for the last eleven years we have confined ourselves to the unleached ash trade, finding from long experience that they were the best adapted for fertilizing purposes and far cheaper even than leached ashes, as they contain all the potash.

During all this time we believe our ashes have given entire satisfaction to those who have used them, and where we have sold once we can always sell again.

Unleached Canada Wood Ashes.

GOOD, HARD WOOD UNLEACHED ASHES from first growth timber, grown on strong land, the soil of which is rich in *Potash, Lime, Phosphoric Acid, Silica, Magnesia and Iron* is the most complete "natural fertilizer" that can possibly be used, as they contain all the fertilizing elements drawn from the NEW and FERTILE SOIL in a well mixed and concentrated form which are required for fruit, plant, tree or vegetable. Where unleached ashes are used upon tree, plant, fruit or vegetable, their chemical action draws from the atmosphere all the nitrogen or ammonia in their growth that is required to carry them on until the ripening process is completed. We know there is a great difference in the value and quality of ashes, and it requires good judgment and long experience to be able to know absolutely the kind of ashes best adapted to meet the needs of agriculture. Our long experience of nineteen years has enabled us to acquire just that knowledge. Our ashes are gathered from house to house (employing as we do, several hundred men and horses for the purpose, housing them as gathered.) We also do our own shipping, and are therefore able to say that our ashes are the best in market. Were it necessary, satisfactory statements could be produced that many have attempted to supply unleached ashes, but from their want of experience as to quality their ashes have not given the satisfaction which had been promised. With us our trade has constantly increased from the first, and we give it our personal and exclusive attention, so that we can most certainly guarantee our unleached wood ashes to be the best and cheapest fertilizer in use. Our making the ash trade our entire business, it is for our interest and yours to ship you

just such ashes as we sell you—the best that can be got, to enable us to hold and continue to increase our trade.

Those who have made the most thorough tests in the use of our Canada Unleached Ashes, assert that they are superior to the best of stable manure for all kinds of fruit and fruit trees, grass and many other crops, and is equally as good for all crops. They produce a steady and permanent improvement of the soil.

HOW UNLEACHED ASHES SHOULD BE APPLIED.

In applying unleached ashes to the soil as a fertilizer, much the same course should be pursued as in the application of stable manure as they are of a vegetable nature taken from the soil by the timber in soluble form, and in such proportions as are natural, combining as they do in themselves and in right proportions POTASH, PHOSPHORIC ACID, LIME, MAGNESIA, SULPHURIC ACID, SILICA and OXIDE of IRON.

It is generally conceded that all crops, fruits and plants do well for many years on new land after the timber has been removed, and until the ashes, potash, phosphoric acid and Lime have been absorbed from the soil by continual cropping. Again, the richer the soil is in Potash, Phosphoric Acid, Lime, Magnesia, Iron and Silica, the longer it will wear. But when the soil becomes old and worn out these elements must be restored in some manner, and the most natural way of doing so is by a liberal application of our Unleached Ashes, made of wood cut from the virgin soil. All fruits and crops are large feeders on Potash, Phosphoric Acid, Nitrogen, Lime and Silica, but more particularly on Potash, and the soil by long and continuous use, having exhausted these ingredients, is brought back to its virgin state where the owner knowing what his land most needs, and supplies that need with the free use of *ashes*, thus restoring it to its natural state as near as may be, and it will then go on again for years producing as large crops as ever, and can be kept up a whole lifetime with small annual dressing, if a heavy dressing was at first given. The lime furnished through the use of Unleached Ashes is a vegetable lime, which is similar to the lime in the bones, but much easier to dissolve, for when mixed with the soils and kept moist by showers it dissolves gradually and soon becomes like phosphate of lime, and then similar to phosphoric acid, and as valuable to crops as those ingredients are

without the application of sulphuric acid. Sometimes for quick and short growing crops a slight mixture of common salt and land plaster with the ashes will dissolve the lime and phosphoric acid and make them work a little quicker the first year. The salt and plaster not acting as a fertilizer, but simply as a dissolvent, will enable the ashes to work readily upon *quick growing* crops like *strawberries, oats* and *potatoes*, and this too without detriment to the soils, provided the ingredients which are forced out by this rapid growth are replaced annually by using the best qualities of ashes, keeping the soil loose, light, mellow and sweet. Upon such soils no sorrel or noxious weeds can grow as is sometimes seen on soils stimulated and forced by quick acting fertilizers made from minerals. Potash, phosphoric acid and lime in ashes and manure being in vegetable form are more soluble or revertable and easily dissolve, consequently more valuable than when in the form of mineral or quick acting fertilizers. Stable manure when thoroughly applied will last from four to six years, while the unleached ashes *thoroughly applied* will last from eight to twelve years. What we mean by *thoroughly applying* the ashes is this: Every farmer knows or can know about how many tons of manure he uses to the acre to grow certain crops, or to do the amount of work he expects to have done in an ordinary season, and also knows about what his manure costs him per ton or car-load—the cost of course varying in different localities. Even when picked up by the wagon load and drawn home, piled up and allowed to lay and rot until ready to use, its cost is not ended until it is spread out upon the field, and by a careful estimate he no doubt will find it has cost him from two to three dollars per ton, besides the large outlay of time and cartage. Purchases are sometimes made of stable manure from boats at a cost of from two to three dollars per ton, others purchase by the cord on cars or delivered at stations at from five to eight dollars a cord, containing two and a half to two and three-quarters tons. Still others purchase by the cord or ton delivered at their places at from two and a half to four dollars per ton, and from five to eight dollars per cord, afterwards to be carted, in many cases long distances. Now, whatever amount of manure is applied per acre to produce the result desired figured down to dollars and cents, and apply that amount in unleached ashes to your soil, and that is what we would call applying thoroughly. When the unleached ashes are thus thoroughly applied at first, it will soon be found that better crops, grass and fruit

can be grown from their use than by the use of manure, and then, too, the fruit will be more luscious and the cereals more plump and solid, of better quality and weighing heavier. At the same time a large saving in cartage is made. Again, the ashes will last over twice as long as the manure, and the land can be kept up to a high state of cultivation uninterruptedly with a light dressing each year, the land growing stronger and better without the use of other manure or fertilizers. Soils which have been entirely run out by too frequent cropping with tobacco so that it was worthless, have been recovered and made to bear as nice crops and of as good quality of tobacco as ever before, by a heavy application of our Unleached Ashes. We think a *thorough application* of the Unleached Ashes at first will prove the cheapest in the end, as it gives the land a richness at once which will last for many years, and although it may seem costly at first, the large returns in crops and higher prices they bring in the markets and long lasting will convince all that they are the cheapest fertilizer that can be used. Also can be kept up afterwards with ashes at half the cost of manure or any other fertilizer.

DIRECTIONS FOR USING OUR UNLEACHED ASHES.

When used in drill, from three to five hundred pounds can be used to good advantage per acre, but in making a thorough application from one to five tons should be used, although when used in quantities of over two tons per acre, they should be spread on top of the ground in the fall or early spring when the ground is not frozen so that the moisture and rains of those seasons of the year will aid in dissolving the potash, phosphoric acid, lime and silica, and enable them to amalgamate with the soil before the planting of seeds—otherwise the strong alkalies coming in contact with the seed might destroy the crop for that year. After sowing broadcast it would be well to harrow in the ashes a little. Should it so happen that good results did not follow the first year's application by reason of a failure of sufficient rains to dissolve all the chemicals in the ashes before hot, dry weather comes on, let them alone, that is, make no application of other fertilizers to the ground, for nothing will be lost by their lying in the soil and their influence will surely be felt in the next year's crops. When once thoroughly leached into the soil they are invaluable in a drought.

We think it would be well for any farmer who has not heretofore used ashes, to experiment for themselves, by using side by side with stable manure and other fertilizers a like quantity, in cost of our Unleached Wood Ashes, and then in another part of the field apply in cost half each of stable manure well mixed with the soil, and as a top dressing unleached ashes well harrowed in.

FOR LAWNS.

When first applying Ashes to the Lawn use from one to three tons of Screened Ashes per acre; spread out as evenly as possible with a shovel, following up with a stiff broom, brushing out the uneven spots to prevent injury to the grass by the strong ashes lying too thick in spots. Their application should be made in the fall or early spring in order that the refreshing rains of spring and the melting snows of winter leach the ashes through the soil more perfectly, and giving the grass an early start in the spring. One effect of this thorough application of the ashes will be found after one or two years that your lawn will be free from all moss, chickweed, mouse ear and sorrel, giving a beautiful dark green to the grass until late in the fall. They are also a valuable aid in holding the moisture, carbonic acid and nitrogen in the soil and rendering the lawn proof against a heavy drought at least for two or three weeks longer than any other fertilizer or manure. This is a great advantage to lawns which lay upon high elevations of land. The first heavy dressing puts the lawn into a rich and productive condition which would last for four or five years. But it is better to follow up each year thereafter with light dressings of from six to eight hundred pounds of this same nicely "Screened" Unleached Ashes applied in Fall or early Spring to replace what is annually taken from the soil, thus supplying a natural food for the grass which becomes a necessity where the lawn is so frequently clipped. If bare spots or weeds and moss exist under the trees the ashes and lawn seed may be raked in such spots with an iron rake; and two or three applications will surely bring in a nice grass, even under trees, that will remain there and become both vigorous and healthy. This result cannot be brought about by the use of any other fertilizer or manure. Old lawns that do not need regrading can be brought into as good a state as it ever was without ploughing up, by simply making a very thorough application from three to four tons per acre of screened unleached wood ashes, and following up annually with lighter applications to prevent exhaustion.

of the soil. In such application it would be well to use a smoothing harrow to cut up the soil and work in the ashes and lawn seed without tearing up the sod. For laying down a new lawn from two to three and a half tons per acre should be spread out broadcast after the ground has been graded; then harrow in about two or three inches deep and allow it to lay until sufficient rain has fallen upon it to leach out a part of the potash, so as not to endanger the seed when sown; then spread evenly from a ton to a ton and a half per acre, then sow the seed and harrow or rake in lightly and roll. This will give a nice lawn, which will be free from weeds, and give better satisfaction than would the use of from ten to fifteen cords of manure, while the expense will be less, even though five tons of ashes had been applied against twenty cords of manure to the acre, which seems to be the usual quantity of manure used for laying down lawns. The ashes not only gives the best satisfaction at first but will last twice as long, and is kept up afterwards with much less expense. In case one has a surplus of manure on hand, without purchasing, it will even then be found preferable to use only one half or two-thirds of what the plot of ground really needs, well worked into the soil, the balance of the money value of the ashes on top to seed down with, making a better lawn than using all manure, and so far avoiding much of the evil attending the use of manure in the growth of weeds and thistles.

When a lawn is looking well some will form the opinion that it does not need top dressing. But this is a mistake, for it should have its *annual food* as certainly as man or beast needs their daily food. Ashes remain in the soil in the form of humus, acting like a sponge, storing up moisture, carbonic acid and nitrogen, as taken from the atmosphere to deliver to the plants as required in their growth in hot, dry weather. The ashes having once passed through the fire in the wood all that remains are the fertilizing elements concentrated in a small bulk, the same as the essences of herbs or fruit. It will be seen by this process of reasoning that it would require very large quantities of manure to rot or burn down to the same strength and value as found in wood ashes. The ashes in this form remain as an addition to the soil. Nothing is lost from them as they lie in the soil exposed to the atmosphere, loosening, sweetening and cleansing the soil and gradually rotting down at the roots of the grass, which in a short time becomes like a velvet carpet. No stable manures are needed for lawns, grass or fruit where good, hard wood unleached ashes are

used. The reseeding or laying down of lawns should be done the last of August or September, or as the frost is leaving the ground in early spring. The early fall being the surest time. We "screen" the ashes when so ordered for lawns at one dollar extra per ton.

FOR PASTURE LAND.

Treat in about the same manner as for lawns. Spread out broadcast from one to two tons per acre, on first application, either in the fall or early spring, and annually give a top dressing with from five to eight hundred pounds. If in bad condition, with the grass nearly run out, harrow some seed and ashes in with a smoothing harrow. White clover will grow spontaneously where unleached ashes are used ; the grass grown from its use being very sweet and tender, the very best that can be grown for milch cows. The practice of spreading the ashes on the snow will do very well provided the soil is not frozen and the land quite level so as not to wash the ashes off.

FOR MEADOW LANDS.

They should be treated very similar to lawns and pastures, by spreading from one to three tons per acre upon the first application, the quantity used depending upon the condition, which should be applied in the fall or early spring, afterwards top-dress annually with from six to eight hundred pounds, the results will be a continued improvement both as regards quantity and quality of crop. If the hay is for the market the sod should be turned under every six or eight years, say in August or September, reseeded with say from six to ten hundred pounds of unleached ashes strewn broadcast, otherwise the hay would become too fine for market purposes, but we think just as good if not better for home use. Red clover comes up naturally where ashes are used without sowing the seed. In reseeding unless a heavy crop of clover is desired, in which case a little seed should be sown, the same bulk grown with ashes will be found to weigh considerably more than where grown with manure. It also contains much the most substance of a strengthening nature besides bringing the highest price in the market. There is no reason why the Eastern States should not produce all the hay required for home use providing good Unleached Ashes are used. It would pay all farmers and gardeners well to use them upon all crops, especially Hay, Fruit, Vegetables, even if they have large

supplies of yard manure to use in connection with the ashes as they work well together on vegetables and some other crops. It is a frequent occurrence to see meadows mowed two and three times a year where good unleached ashes are used as they produce a very rapid growth of grass.

For vegetables and garden truck, wood ashes are found very valuable when used alone or with stable manure. If manure has been pretty freely used, it would be well to use the ashes alone, spreading it broadcast say from one to three tons to the acre either in the fall or quite early in the spring, so that the action of the warm rains will leach the ashes out into the soil. Afterwards use at least one half of money value, in ashes, that is expected to be applied and the balance in manure. They should be well worked into the soil together, producing a quick action and forcing the vegetables forward with great rapidity, giving a large, smooth, healthy growth and a good yield. For vegetables for very early use, to be grown rapidly, add from one to two hundred pounds of sulphate of ammonia or nitrate of soda per acre, a little in each hill or drill, the balance around the plant on top of the ground in the working or hoeing process to work into the soil a little so as not to lay exposed to the atmosphere for the nitrogen to escape. The longer the ashes can be applied to the soil before it is required for planting the better, as a greater opportunity is given for storing up carbonic acid and ammonia and of getting the soil into condition to act quickly.

FOR FRUITS AND FRUIT TREES WOOD ASHES HAVE NO EQUAL.

Nothing but *Unleached Wood Ashes* should be used around fruit trees, they being a natural food as taken by the tree from the soil rightly prepared and proportioned by nature for the tree and its fruit, gives to the tree a healthy condition, preparing it to resist diseases of all kinds, such as the "yellows" and "blight" among peach and pear trees, diseases which are unknown where unleached ashes have been used from the setting out of the tree. They are also a great prevention to the ravages of the "borer." The fruit also will be large, sweet, fine grained and of a bright color. Many trees are ruined, and the fruit rendered almost worthless where manure or ammoniated fertilizers are used, making a heavier growth of wood, and giving to the fruit a coarse, wooded texture, often cracking open, and an insipid taste. Ashes give it the necessary food both for the health

and growth of its wood and the perfection of its fruit, as well as contributes to the quantity which the tree may bear. Those who have had the largest and most valued experience in the use of unleached ashes with fruit say that they would rather pay from forty to fifty cents per bushel or twenty to twenty-five dollars per ton if they could not be got at a less price for grass, strawberries, peaches and all kinds of fruit than purchase any other fertilizer or manure for those uses.

FOR HOUSE PLANTS AND GREEN HOUSES.

Unleached Wood Ashes are found to be very valuable in growing the plants, giving them good, bright healthy colors and keeping out insects leaving no unpleasant odors, and a much better fertilizer even than cow manure for roses.

For Pots from three to four inches across the top, about a teaspoonful should be spread evenly over the tops of the pots for two or three months. Then every once a month for about six months. Then every two or three months; increase the quantity according to the width and depth of the pots. In potting plants a few ashes should be well mixed with the soil and a light top-dressing afterwards.

FOR PEACH TREES.

Around young trees, just set out, two to three pounds of Unleached Ashes worked or raked into the soil will be sufficient, but care should be taken that they are not allowed to come in contact with the bark of the trees; they should be spread out about as far as the branches of the tree extend or even a little farther. As the tree advances in years the quantity should be increased at the rate of about one to two pounds annually until the tree begins to bear, and then the increase should be from three to four pounds each year. If the tree is a heavy bearer the quantity can safely be increased up to from twenty to fifty pounds per year. The largest portion of the ashes should be spread out near the ends of the roots of the tree, as the small fibres and roots of the tree take up the largest portion of its food; then also the further away from the body of the tree the roots extend, the less liable is the tree to be affected by winds or disease. If nothing but unleached wood ashes are used around the peach tree from the time of setting out it will be found that the tree will continue in a healthy condition and less liable to be affected by the "yellows" and

“borers” and will resist all other diseases as they come along. The bark will be smooth, the tree hardy and long lived, and the fruit large and of a superior color and most delicious flavor. Its start in the spring is steady, its growth gradual through the whole season, and the ashes will largely aid it through the hot, dry weather, and its fruit ripens from five to eight days earlier than when other fertilizers are used, and then, too, the wood of the tree ripens earlier and more perfectly, enabling it to withstand more readily the severe frosts of winter. Peach trees, and in fact all fruit trees, require large quantities of potash, and the carbonate of potash which is found to exist in wood ashes far exceeds all other potash for all fruit and fruit trees; but no fruit trees can live entirely and do well upon potash unaccompanied with the other elements contained in Ashes. They need the Potash, Phosphoric Acid, Lime, Magnesia, Silica and Iron, together with all the other elements found in Unleached Ashes, and then the large amount of vegetable lime and other elements found in the Ashes, and counted almost worthless by the chemist in his analysis, does become of great value when applied to the peach orchard. Old orchards or orchards with trees varying in age from five to fifteen years, should receive a bountiful supply of Unleached Ashes when first applied, of say from twenty to seventy-five pounds, as the soil absorbs a large portion of their strength before the roots of the tree are reached and afterwards from ten to fifty pounds each year. It is better in such cases to apply the ashes in the fall or early spring so that the fall rains and melting snow will aid in the leaching process and give the ashes a better opportunity to reach more effectually the small roots and fibres of the tree. Care should be taken that neither the ashes or earth are piled up around the trunk of the tree, causing the bark and wood to become soft and spongy, but every spring all substances should be scraped away from around the body of the tree letting in the sun, air and water and a few *Unleached Ashes* scattered close to the bark will effectually kill all insects and be a sure preventative against borers doing their deadly work. It is well sometimes to scatter a few ashes through the branches of the tree in damp weather. The alkali thus produced will prove certain destruction to all insects and worms. Peaches grown by the use of Unleached Ashes always bring from five to fifteen cents per basket more in any market. The general effect of Unleached Ashes upon peach orchards is to ren-

der the trees younger as well as every-year-bearers and the fruit fine in quality and luscious in taste.

APPLES, PEARS, PLUMBS, QUINCES AND ORANGES.

Apples, pears, plums, quinces and oranges should all be treated quite as thoroughly as the peach, applying even larger quantities of the Unleached Ashes in proportion to the bearing qualities of the tree. Even one to two hundred pounds of the ashes for a large apple, plumb or pear tree, for the first time applying, will be of great value to the tree, and then no danger need be apprehended from their use provided they are spread out evenly on the surface of the soil, heaviest near the ends of the roots, care being taken that they are not piled up around the body of the tree. It would be well to scatter a few of the Ashes through the branches of the apple tree when not in bloom and the tree a little damp, the effect of which will be to rid the tree of all insects and worms. Other ammoniated fertilizers of the quick acting kind should be avoided if the life of the tree and flavor of the fruit is aimed at. In setting out trees it is well to mix some of the unleached ashes with the soil as they will give to the trees a better start, rendering them fruitful each consecutive year. Trees have been found to bear from a half to one bushel each of nice smooth apples the third year from setting out, while a part of the same orchard at the same time treated with the same money's value in manure did not have a single tree that bore fruit. This shows the value of ashes for young orchards in their early bearing.

FOR GRAPES.

When new vines are set out the soil should be mixed with our *Unleached Ashes*, say one or two pounds to each root and about the same quantity spread over the top of the ground increasing the quantity year by year until the vines are five or six years old, using at that age say eight or ten pounds to each vine. After this the ashes should be spread over all the ground in the vineyard, being governed in regard to the quantity to be used by the number of vines to be fed. We think a thorough application should be made to an old vineyard the first time the ashes are applied of say from two to three tons per acre, which should be followed up each year afterward with applications of from eight to twelve pounds for each vine. The best time for applying

is the fall or early spring. Such an application of our Unleached Ashes is certain to produce a yield of grapes of good color and most delicious flavor, ripening from five to ten days earlier than when stable manure is used and bring a better price in market, and the clusters will last much longer without the the grape shelling off. The potash in ashes being carbonate of potash, will find the roots of the vines as soon as *sulphate of potash* and is much the best in its results upon the vine and fruit.

FOR STRAWBERRIES.

From one to three tons of our Unleached Ashes per acre can be used with good advantage in the cultivation of this most delicious fruit. Great care should be exercised that the ashes do not get upon the plant, unless they are at once brushed off, a broom being used for the purpose. Before new vines are set out the ground should be well ploughed and an application of from one to two tons of our Unleached Ashes scattered broadcast and then thoroughly harrowed in. Then set the vines and top-dress over the hills with from a ton to a ton and a half per acre. In top dressing old beds use from 1 to $1\frac{1}{2}$ tons per acre. August, September or October are good months to make the application as the potash, phosphoric acid, lime, silica and iron then has a good opportunity to become thoroughly leached into the ground and ready for active work upon the vine in the early spring. Experiments have been made in the culture of strawberries using \$100 worth of Unleached Wood Ashes upon one acre, and right along side of it another acre upon which \$150 worth of cow manure was used. From the acre upon which the *Unleached Ashes* were used 11,000 quarts of the most delicious berries were picked, while from the other acre upon which the \$150 worth of cow manure had been used only 9,000 quarts were picked, and this result was obtained for two successive years with the one dressing.

It would be better to crop the ground for one year prior to starting the strawberry beds, applying two or three tons of *Unleached Ashes* to the acre with such crop, and an equal quantity when setting out the plants. By this course the husbandman will be rewarded by large crops of better and more delicious berries, that will bring the highest prices in the markets, and standing up longer than when raised by the application of manures, and a very much sweeter berry.

FOR POTATOES.

Unleached Ashes may be used in planting potatoes by applying from one thousand to two thousand five hundred pounds, scattered out well over the tops of the hill or drill, say from 12 to 18 inches just after the potatoes are covered, or half of that quantity can, be put in the hill and mixed with the soil before the potatoes are planted, and afterwards a like quantity scattered well over the tops of hills or drills. But we think the better course to pursue would be in the fall, before the ground freezes up, to apply say from two to four tons of Unleached Ashes spread broadcast over the field; in the spring plough, harrow and plant the ground as in the usual way. With such an application the same field could be ploughed up in the fall, making the furrow a little deeper than in spring, which will bring the ashes to the surface again, seed down with wheat or rye to be cut the following year, resulting in an astonishing yield with a plump, heavy berry to be followed year after year with an abundant crop of grass. And then, too, with so thorough an application of Unleached Ashes in the fall it will be found, we think, that by the action of the alkalies brought out by the heavy rains and the melting snows it will effectually kill the great pest of the potato field—the potato bug—and other insects so prevalent in some sections of our country. The most thorough tests prove that thirty-five dollars worth of our Unleached Ashes to the acre for potatoes, subsequently followed with crops of grain and grass lasted longer and gave better satisfaction than forty-five dollars worth of New York stable manure. Some experiments have been made using half the usual quantity of manure and an equal quantity in value of unleached ashes with very good results on the potatoes, but the effect upon after crops, and particularly grass was not as good as when ashes alone had been used. Potatoes require large quantities of potash, phosphoric acid, lime and silica.

It is a well known fact that the Long Island farmer frequently uses from \$50 to \$80 worth of stable manure per acre, besides the cost of cartage from the car or stations. The use of an equal amount of money in Unleached Ashes per acre will give them better results, producing more and heavier potatoes that will not shrink in weight, and lasting in the soil at least twice as long as the manure. Two or three hundred pounds of land plaster per acre in and on the hills or drills worked in while hoeing *contributes* to make the ashes work quick, hold moisture, and make the potatoes smooth. When the potatoes are for very early use the ad-

dition of from 100 to 200 pounds of sulphate of ammonia or nitrate of soda per acre, part in the hill or drill, the balance on top upon hoeing to be worked in the soil, will assist in the early growth of the potatoes. Potatoes grown with ashes contain large quantities of starch, cook very *dry* and *mealey*, and are not liable to "rot."

FOR SWEET POTATOES.

Spread broadcast from one to two tons of *Unleached Ashes* for each acre in the fall or early spring. After the plants are set apply over the hills covering from twelve to fifteen inches surface about one-fourth of a pound to each hill; or say six to eight hundred pounds per acre. Where no ashes are spread broadcast in the fall, then mix well in forming the hill about one-third of a pound of the ashes with the soil as long as possible before setting out the plant and apply over the hills as above directed. It will be found that ashes aid very largely in holding the moisture in light sandy soils growing a smooth, nice potato, and that they are not liable to be troubled with black spots or affected with the "rot" as where grown with stable manure. Unleached Ashes are considered cheap even at \$20 to \$25 per ton by those that have made thorough tests on sweet potatoes. They work well alone or in connection with muck;

FOR CORN.

As a light top-dressing 500 to 700 lbs. of *Unleached Ashes* can be used per acre to spread on top of hills as soon as the corn is planted, covering from twelve to fifteen inches of the ground. We should not advise putting the ashes in the hill when planting the corn, as it might work injury to the seed. From one to two tons per acre could be spread broadcast over the field after the ploughing, and then harrowed in before planting, then top-dress the hills with from four to six hundred pounds to the acre. We think, however the better way to apply ashes, is to make a thorough application of from one to four tons, usually about two or three tons per acre according to condition of the soil in the summer or early fall by spreading broadcast over the field, thus giving the ashes an opportunity to leach down into the ground, killing all grubs and insects. Plough in the spring, harrow and plant as usual, and a good crop will be assured. Then for the second year we should advise turning over and plant to potatoes and top-dress with from five hundred to seven hundred pounds per acre. At the end of the second or third year sow to wheat or rye and seed down to

grass. The result will be a heavy crop of hay for many years. No further fertilizing will be needed for from six to eight years. Such an application will work splendidly on sod land, the Silica and Potash in the ashes causing the corn to ripen early, stand up well and prevent lodging.

FOR WHEAT, RYE AND OATS.

A light application of *Unleached Ashes* could be made when putting in the seed, of say 300 to 500 lbs. per acre or what will readily work through the drill. Then spread from one to two tons per acre on top and harrow in lightly; but if the field is to be seeded down for grass we think it will pay well to spread as high as from two to four tons per acre. For oats it would be well to spread the ashes the fall before to lay awhile; then just before the ground freezes, say in November, plough with a light furrow and again plough in the spring with a little deeper furrow, bringing the ashes back near the surface, then harrow and sow as usual. Those unacquainted with the use of our *Unleached Ashes* may think such thorough application will be apt to cause the grain or grass to "lodge" or "lay down" by producing such rank growth, but this is overcome by the large amount of silica contained in the ashes which gives to the straw or "stalk" a coating which stiffens it and at the same time causes a stockier growth not as tall, slender or weak as results from the use of manures, at the same time the farmer is rewarded for his labor by the return in his grain field of a plump, full berry. It may be well, when using *Unleached Ashes* for wheat, to mix with them in about the proportion of 1200 lbs of ashes, 300 lbs. of land plaster and 200 lbs. of sulphate of ammonia just before drilling, and drill in with the wheat at the rate of from two to four hundred pounds of the mixture per acre.

FOR ONIONS.

A thorough application of *Unleached Ashes* is necessary to insure a good crop of onions. From three to five tons of ashes per acre should be applied in the fall scattered broadcast and ploughed under just before the ground freezes up, and in the spring the field should be again ploughed bringing the ashes to the surface, then harrow and plant seed. If the ground is light and mellow it can be ploughed in the fall and the ashes spread broadcast and harrowed in, and then in spring harrow and cultivate and sow the seed. When such a thorough application is made the first year a ton only per acre will be required for the second, one and

a half tons the third, and but two tons the fourth year, and after that two tons per year is all that will be required. Lands treated in this way not unfrequently yield from six to eleven hundred bushels per acre. Tests have also been made with manure and ashes on land side by side in growing onions, value of manure and ashes being alike as they were applied, and the results always largely in favor of the ashes, producing larger and nicer onions; in some instances over a hundred bushels more being harvested from a single acre, than where the manure was used. The onions raised upon the ashed land were almost free from smut, maggots and weeds, the land requiring but about half the quantity in value of ashes for succeeding years, as of manure. Where the maggot is very troublesome it is well to spread a light dressing of ashes over the onions occasionally so that the rains may leach out fresh potash to destroy them.

FOR CABBAGE AND CAULIFLOWER.

From two to four tons of unleached ashes per acre should be scattered broadcast very early in the spring or in the fall and harrowed in, thus giving them good time to leach out into the soil before ploughing. After setting out the plant scatter about half a pint of the ashes upon the ground around the plant. With such an application cabbage can be raised several years in succession on the same soil resulting in the growth of a large solid head, and the soil will also be left in splendid condition for other crops should a change be desired. If, however, cabbage should continue to be grown upon the same soil succeeding years, better results would be obtained, should the land receive a top dressing each year, of say one ton the second year, one and a half tons the third year and two tons the fourth year, spread on in the fall or spring. Smaller quantities can be used with better results than will come from the use of an equal amount in money's worth of stable manure. But we favor the heavy application at first as only lighter dressings are needed afterward. In using lighter quantities one-half pint of unleached ashes can be worked into the soil before setting out the plant, and afterward spread around the plant one-half of a pound of ashes. Half ashes and half the value in manure well worked into the soil works good together for cabbage and cauliflower.

FOR TOBACCO.

We would advise a thorough application of our *Unleached Ashes*, of say three to four tons per acre spread

broadcast in the fall so as to give them the benefit of the early spring rains for the leaching process before ploughing. After setting out the plant one thousand to fifteen hundred pounds per acre can be used to scatter over the surface covering from ten to twelve inches around the plant. When the ashes are applied in the spring two to three tons per acre would be all that could be safely spread when the ashes are not applied until after the ground is ploughed two tons per acre only would be safe to spread on and harrow in, and then for top-dressing the same quantity above named. One thousand to fifteen hundred pounds per acre could be scattered around the plant a few days after a good heavy shower had come to leach in those previously applied. We think, however, the safest and best way to apply unleached ashes to tobacco is by a thorough application at first in the fall, thus assuring a good crop and the best quality the first year and a still better crop the second year, and with like results year after year, with only light top-dressing annually, of say one ton the second year, two tons the third year, and about two and a half tons the fourth year, and the land will never wear out, but continue to improve and return better crops. The reasons for this are self-evident, for tobacco requires more lime than any other plant, and it also requires large quantities of potash, magnesia and silica, and these are found to exist in unleached ashes more evenly and in the best proportions, and being free from chlorine are undeniably the best as well as the cheapest fertilizer for tobacco and for the land upon which it is grown. The outlay in ashes should be equal in amount to the outlay in money in manures and the result will satisfactorily prove that unleached ashes are the best and cheapest fertilizer for tobacco that can be produced, besides giving to the tobacco a fine, smooth silkier leaf, drying a good color and when smoked burns a beautiful white ash, and sells in market at from three to five cents per pound higher than tobacco raised on lands enriched by other fertilizers that contain but little or no lime. As a test of the value of Ashes in the growth of Tobacco, use in an adjoining piece of ground an equal amount of manure and ashes in money value, and the result will be found very largely in favor of Ashes.

FOR CUCUMBERS AND MELONS.

The quantity of ashes to be used depends upon the condition of the soil, and when it is ascertained about how much stable manure in value it would be advisable to use, take about the same value in our *Unleached Ashes* and spread broadcast in

the fall or early spring as soon as the ground is ploughed, giving as much time to the ashes to work in the soil as possible before planting the seed. At this first application we would advise that about two tons per acre be used. After the hill has been formed and the seed planted it would be well to scatter about a half pint over the top of the hill. But if no ashes are spread broadcast then work into the hill when forming it about one half of a pint or one-third of a pound of ashes before planting the seed, and afterward apply about one-third of a pound scattered over the hill as soon as planted. Ashes will grow the best cucumbers and melons and keep them green and in bearing condition the longest of any fertilizer.

FOR COTTON.

A thorough application of from one to three tons per acre should be made, and allowed to lay until copious rains have fallen, giving the potash, phosphoric acid, lime, magnesia and silica an opportunity to leach out and thoroughly mix with the soil, then plough, harrow and plant as usual, or apply around the plant well scattered out.

HOPS.

In applying *Unleached Ashes* to hops, much the same treatment should be observed as in treatment of grape vines, the effect of which will be to render them fruitful each consecutive year, and producing crops of a beautiful color and free from insects. Those who have used ashes in the culture of hops pronounce them unequalled as a fertilizer.

TESTIMONIALS.

The following are a few of the hundreds of testimonials held by us, but not having the room for them in this pamphlet we insert only what follows:

July 16, 1885.

Messrs. Munroe, Judson & Stroup:

Gentlemen—I have used leached and unleached ashes for many years, and for the past twelve years have used the Canada leached ashes, imported by Munroe, Judson & Stroup, and found them as recommended by them, and they have given very good satisfaction. But for the past nine years I have used Canada unleached ashes imported by them with much better results—50 bushels of unleached ashes per acre giving better satisfaction than 100 bushels of leached ashes per acre, and lasting longer; (as I find the soil needs more potash than can be obtained from leached ashes,) and giving good results from seven to eight years. I find that one bushel of Canada unleached ashes is of more value than two and three of our home ashes. I consider the Canada ashes the cheapest and best fertilizers to be had.

Yours &c.,

B. W. TUCKER.

Dec. 19, 1884.

Munroe, Judson & Stroup, Oswego, N. Y.:

Dear Sirs:—I have tested your Unleached Ashes with New York stable manure side by side on peach trees, grape vines and strawberries for three seasons and no failure of a good crop from either kind of fruit upon which I used the ashes. But my crop of peaches failed this year where the manure was used. Those grapevines upon which I used the ashes produced grapes of a much finer quality and ripened nearly one week earlier and did not shell off as those did where I used the manure as a fertilizer. I find your ashes so much better and cheaper for all kinds of fruit that I this fall purchased two car loads, about thirty tons, at \$15 per ton, instead of buying stable manure, as heretofore, at \$2.25 per ton, on boats on the dock here. I sometimes use a small quantity of manure for mulching my strawberries. I shall continue to use your ashes in preference to the stable manure so long as I find such a difference in the results as exhibited upon my farm where the two kinds of fertilizers are so well known.

Yours, &c.,

D. D. MACKEY.

VEGETABLE ANALYSES.

The following analyses show the quantity of the elements which are taken from the soil and atmosphere by the average crops as here given. It will readily be seen that our unleached wood ashes contain and furnish to the soil all the elements required in the cultivation of these several crops :

POTATOES.

One hundred bushels and tops	lbs.
Take from the soil and atmosphere, potash.....	179.00
.. phosphoric acid	52.00
.. lime.....	60.00
.. sulphuric acid.....	29.00
.. ammonia.....	22.50
.. magnesia.....	19.00
.. silica.....	43.00

TOBACCO.

One ton of tobacco leaf and stem as grown	lbs
Take from the soil and atmosphere, potash.....	147.00
.. phosphoric acid.....	17.00
.. lime.....	178.00
.. sulphuric acid.....	19.00
.. ammonia none.....	—
.. magnesia.....	50.00
.. silica.....	46.00

COTTON.

One ton cotton fibre, seed and stalk	lbs.
Take from the soil and atmosphere, potash.....	154.00
.. phosphoric acid.....	60.00
.. lime.....	71.00
.. sulphuric acid.....	16.00
.. ammonia none.....	—
.. magnesia	44.00
.. silica.....	15.00

CORN.

One hundred bushels ears and stalks	lbs.
Take from the soil and atmosphere, potash.....	180.00
.. phosphoric acid	79.00
.. lime.....	48.00
.. sulphuric acid.....	23.00
.. ammonia	81.00
.. magnesia	35.00
.. silica.....	168.00

WHEAT.

Twenty-five bushels wheat and straw to the acre	lbs.
Take from the soil and atmosphere, potash.....	36.00
.. phosphoric acid	27.00
.. lime.....	14.00
.. sulphuric acid.....	7.00
.. ammonia.....	52.00
.. magnesia.....	20.00
.. silica	145.00

RYE.

Thirty bushels rye per acre and straw	lbs.
Take from the soil and atmosphere, potash.....	33.00
.. phosphoric acid.....	22.00
.. lime.....	14.00
.. sulphuric acid.....	21.00
.. ammonia	43.00
.. magnesia	7.00
.. silica.....	98.00

OATS.

Thirty bushels oats per acre and straw	lbs.
Take from the soil and atmosphere, potash	14.00
.. phosphoric acid.....	16.00
.. lime.....	10.00
.. sulphuric acid.....	10.00
.. ammonia	45.00
.. magnesia.....	8.00
.. silica	48.00

BARLEY.

Thirty bushels barley and straw per acre	lbs.
Take from the soil and atmosphere, potash.....	33.00
.. phosphoric acid.....	15.00
.. lime.....	10.00
.. sulphuric acid.....	7.00
.. ammonia	41.00
.. magnesia	6.00
.. silica	77.00

CLOVER HAY.

One ton clover hay	lbs.
Take from the soil and atmosphere, potash.....	40.00
.. phosphoric acid.....	10.00
.. lime.....	38.00
.. sulphuric acid.....	4.00
.. ammonia	26.00
.. magnesia	11.00
.. silica	10.00

TURNIPS.

Twenty tons turnips per acre	lbs.
Take from the soil and atmosphere, potash.....	140.00
.. phosphoric acid.....	43.00
.. lime.....	90.00
.. sulphuric acid.....	50.00
.. ammonia	42.00
.. magnesia	14.00
.. silica	53.00

PEACH TREES AND ITS FRUIT.

One ton peach wood and one ton fruit takes from the soil and atmosphere about as follows :

	One ton Peach wood.	One ton Peach fruit.
Potash.....	26 lbs.	74 lbs.
Phosphoric acid.....	4 "	12 "
Lime	54 "	2 "
Magnesia.....	7 "	6 "
Sulphuric acid.....	6 "	5 "
Oxide of Iron.....	2 "	1 "
Silica	5 "	20 "

ANALYSES OF UNLEACHED AND LEACHED ASHES.

We give below the average analyses of nineteen samples of unleached ashes and of thirteen samples of leached ashes made at the "Connecticut Agricultural Experiment Station," which can be found in "Appleton's Farmers' Annual Hand Book for 1883," as follows:

	Unleached Ashes.	Leached Ashes.
Moisture.....	6.7	30.9
Silica and insoluble.....	13.7	11.7
Alumina and Oxide of Iron	2.8	2.1
Lime	30.9	29.7
Magnesia.....	4.9	3.0
Potash.....	7.7	1.1
Soda.....	1.0	0.4
Sulphuric Acid.....	1.4	0.1
Phosphoric Acid.....	2.1	1.5
Chlorine.....	0.6	0.1
Carbonic Acid.....	23.2	21.1

It will be seen from the above analysis that leached ashes contain only one-seventh as much potash as unleached ashes, and although they are sometimes sold at from 18 to 24 cents per bushel, and are considered valuable as a fertilizer even at that price, thus proving the great value of the large quantity of vegetable lime which the Canada ashes contain yet the unleached ashes, containing as they do seven times as much potash as the leached ashes and very much richer in Phosphoric acid Magnesia, Sulphuric acid and Soda, renders the unleached ashes more than three times as valuable as the leached ashes.

The following analyses are taken from the "Thirteenth Annual Report of the State Board of Agriculture of Massachusetts of 1882," from page 409, which gives the analyses of two samples of unleached ashes from different parts of that or an adjoining state, and by comparing them with the analysis of our Canada unleached ashes, at once shows the great difference between the home and Canada ashes in potash, lime, insoluble matter and value.

	1.	2.
Moisture	1.78 per cent.	2.26 per cent.
Potassium oxide (potash).....	2.90 " " "	3.26 " " "
Sodium oxide.....	not determined	1.83 " " "
Calcium oxide (lime)	4.84 per cent.	20.29 " " "
Magnesium oxide.....	.315 " " "	not determined.
Phosphoric acid.....	1.55 " " "	1.28 per cent.
Insoluble matter.....	63.93 " " "	35.15 " " "

—(--)—

We give below the analyses of two samples of our ashes made by Prof. George H. Cook, of New Brunswick, N. J., which can be found in the New Jersey State Report for 1884.

Pure Potash.....	8.72	5.87
Phosphoric acid.....	1.17	2.02
Lime	36.80	42.60

It will be seen in nearly all analysis of wood ashes that there is from 15 to 18 per cent. in the form of magnesia, soda, sulphuric acid, silica, carbonic acid, alumina and oxide of iron that is not given which are all of great value for the soil and all crops and fruits. As many soils are largely deficient in those constituents in available forms to be taken up as required by the plant. The mechanical condition of any fertilizing material, simple or compound, deserves the most serious consideration of farmers when articles of a similar chemical character are offered for their choice, as the de-

gree of pulverization or fineness with a thorough mixture of all constituents required by all plants their conditions for solubility, and the more or less rapid diffusion of the artieles of plant food throughout the soil in the most natural form should, without exception control the value of the fertilizer, and there is no way whereby a fertilizer can be got into so fine a state and so thoroughly mixed as wood ashes. They contain all the constituents as found in the new soils. The potash is soluble at once making it worth at least $8\frac{1}{2}$ cents per pound delivered. The phosphoric acid in ashes being in a reverted form once having been taken from the soil in a soluble vegetable form, and easy to become soluble again upon being applied to the soil makes its value at least 10 cents per pound at destination of shipment in comparison with any other forms at which it can be procured in the same condition as in ashes. The vegetable lime in ashes being so very fine and four or five times as strong as stone lime all prepared for the soil and plant, and easy to become soluble makes it worth at least 1 cent per pound, and at these figures shows our ashes to be worth per ton by allowing the average of the potash to be only 7 per cent. the phosphoric acid 2 per eent., the lime 39 per cent., \$26.60 for those ingredients alone, and by the addition of the silice, iron, magnesia and carbonic acid proves them to be worth at least 29 dollars per ton and their use upon the crops will show their value even above these figures.

We give below some of the analyses of our ashes taken from the Massachusetts Board of Agriculture report for 1883, made by Prof. C. A. Goessmann, Amherst, Mass.:

Moisture.....	16.70	8.33	1.03	10.01
Calcium oxide (lime).....	35.26	45.00	50.02	35.67
Potassium oxide (Pure Potash)	5.55	5.91	6.94	7.19
Phosphoric acid.....	2.28	1.74	1.29	1.28
Insoluble matter.....	4.90	3.88	2.28	6.27
From Bulletins No. 11 and 13 for 1884.				
Moisture.....	5.46		15.00	
Calcium oxide (lime).....	35.68		35.22	
Potassium ox de (Pu e Potash).....	5.83		5.50	
Magnesium oxide.....	0.61		3.24	
Phosphoric acid.....	2.55		2.53	
Insoluble matter.....	11.95		9.05	

To RICHARD WEBSTER, Haverhill, Mass. :

The wood ashes received from you marked MUNROE, JUDSON & STROUP, of Oswego, New York, said to be Canada ashes contain

Potash,(K. O.).....	5.42
Phosphoric Acid, (P. O.).....	1.53
Lime, (Ca. O.).....	35.40
Iron and Alumina.....	.92
Carbon and Carbonic acid.....	32.78
Moisture.....	13.01
Magnesia (Mg. O).....	2.65
Silica.....	8.29 — 100.00

These ashes are evidently pure, unadulterated wood ashes. They have, however, absorbed considerable moisture and carbonic acid from exposure to the air. Their market value would be about as follows :

5 42-100 lbs of potash @ 10c.....	.5420
35.40 lbs of lime @ $\frac{1}{4}$ c.....	.885
1.53 lbs phosphoric acid @ 10c.....	.1530 — .7835
Value per bushel.....	39 17-100

If these ashes were perfectly dry they would be worth 45c per bushel at the market rates for POTASH, PHOSPHORIC ACID and LIME. Crude potash is worth 6c per pound. This only contains about 50 per cent. of pure potash, K. O., so that the price of potash in this form is 12c per pound.

The carbon or charcoal in wood ashes also adds to their value as a fertilizer.

The potash in the wood ashes is of considerable more value than when it exists as a chloride or sulphate, as in the German potash salts.

Respectfully,

S. P. SHARPLES,

State Assayer, Boston, Mass.

The load from which the above sample was taken had been drawn from the car and piled up on the ground and exposed to the air for six months. Had the analysis been made when the car was unloaded, their value would have been shown to be at least 45 to 50c per bush, or from \$20 to \$25 per ton. It is a well known fact that the chemical action and the beneficial effect as well as the lasting capacity of the ashes in the soil, renders them more than twice the value that they actually analyse.

EVERY ELEMENT SHOWN IN THE ANALYSES

TO EXIST IN

Hardwood Unleached Ashes,

BECOMES OF

INTRINSIC VALUE

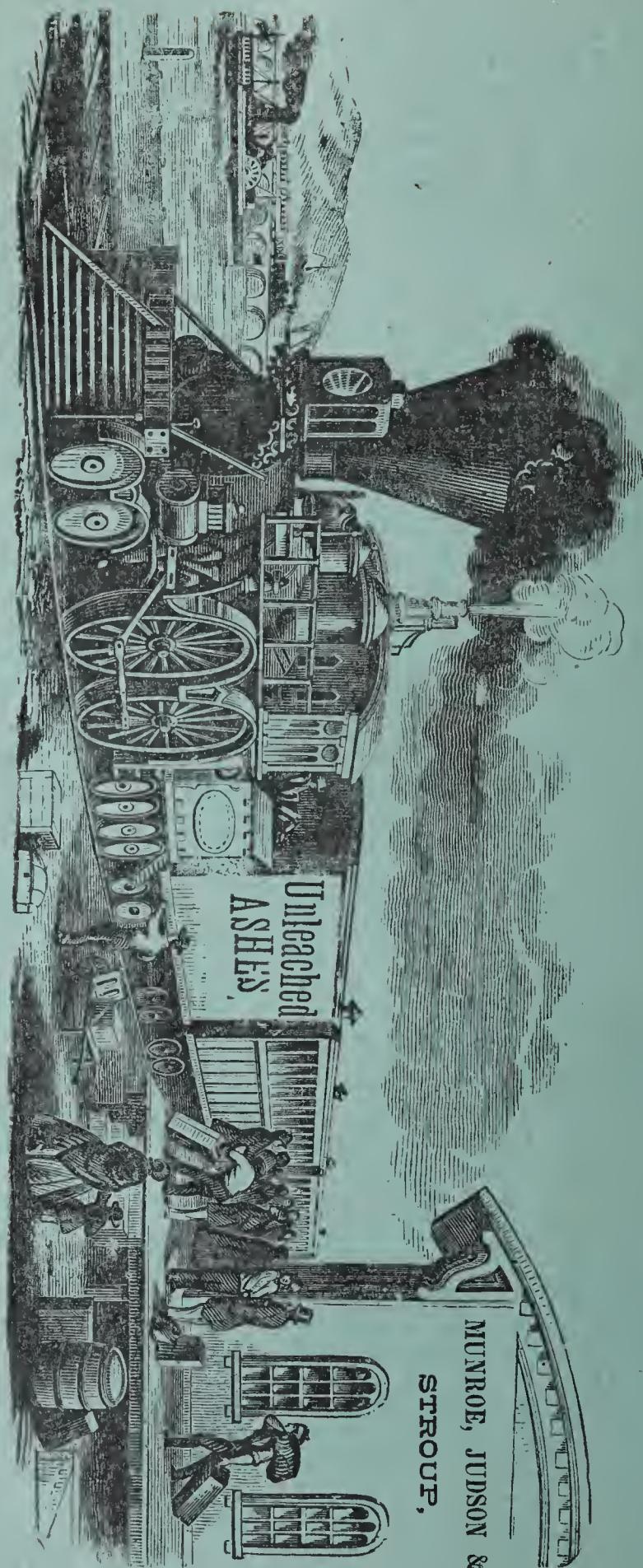
AS A

FERTILIZER !

WHEN APPLIED TO THE SOIL, WHETHER
THAT SOIL IS COMPOSED OF

SAND, LOAM, MUCK, CLAY,

OR ALL FOUR.



MUNROE, JUDSON &
STROUP.